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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,959	03/01/2004	Takemori Takayama	03773/LH	2156
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EXAMINER				
YEE, DEBORAH				
ART UNIT		PAPER NUMBER		
1793				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/790,959

Applicant(s)

TAKAYAMA, TAKEMORI

Examiner

Deborah Yee

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 20-23 and 25-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-12, 20-23 and 25-27 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/11/08.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed February 20, 2009, with respect to the rejection(s) of claim(s) 1 to 12, 20 to 23 and 25 to 27 under 35 USC 103 as being unpatentable over EP 0950723 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 7 to 9 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese patent 408081738 ("JP-738").
4. JP-738 in tables 1-3 discloses roller bearing steel alloys 7, 10 and 12 which are subjected to rapid induction heating to a temperature of 1000°C followed by quenching to produce a hardened martensitic surface layer. Note the prior art composition and its process of making meet the recited claims 1, 4, 7, 9 and 20.
5. Even though rolling element steel comprising 0.4 to 4.0% by vol. of carbides having an average particle diameter of 0.2 to 5 µm and an induction hardened surface layer comprising soluble carbon concentration of 0.3 to 0.8 wt%, carbides in an amount of 0.4 to 4.0% by volume and cementite in an amount of 2 to 15% by volume as recited by one or more of the claims is not taught by JP-738, such properties would be

expected since composition and process of making are met and in absence of evidence to the contrary.

6. Even though rolling element wherein retained austenite is present in the quench hardened layer as recited by one or more of the claims is not taught by prior art, such properties would be expected since composition and process of making are met and in absence of evidence to the contrary.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5, 6, 10 to 12, and 25 to 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 408081738 ("JP-738") in view of Japanese patent 360162726 ("JP-726") or European patent 1273672 ("EP-672").

9. JP-732 in table 1 discloses example 17 having a composition that meets claim 5 except for ≥ 0.2 wt% Al. Nevertheless, it is well known in the metallurgical to add ≥ 0.2 wt% Al to analogous bearing steel alloys to achieve improvement in surface pressure strength as evident by EP-672 in paragraph [0028]. Since high strength would be desired by JP-732, then it would be an obvious modification well within the skill of the artisan to incorporate Al to JP-732 steel in view of secondary teaching.

10. JP-732 does not teach cementite and retained austenite in quench hardened layer as recited by claim 6 but such properties would be expected since composition and process of making are closely met, and in absence of evidence to the contrary.

11. In regard to claims 10 to 12, and 25 to 27, JP-732 teaches rolling bearing element, which would include gear. Although induction hardening the teeth of a gear followed by shot peening to create residual compressive stress to achieve high fatigue strength and wear resistance are not taught by JP-732, such process steps are conventional and well known in the art to produce gear, as evident by the English abstract of JP-726; and hence would be obvious for one of ordinary skill in the art to incorporate to the JP-738 bearing steel. In addition, the residual stress of at least 50 kgf/mm² as recited by claim 11 would be a matter of routine optimization well within the skill of the artisan to determine and productive of no new and unexpected.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 12, 21 to 23 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

14. Regarding claims 12 and 25, the word "means" is preceded by the word(s) "mechanical" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the

element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

15. Claim 21 recites "wherein by use of a steel in which the Cr concentration of the cementite has been adjusted" is indefinite because process step is not actively recited. To add clarity, it is recommended to use language such as ---comprising the steps of subjecting steel to a Cr concentration treatment by heating the steel such that an average Cr concentration of cementite dispersed in the steel is 2.5 to 10 wt%; and to a thermal treatment for spheroidizing the cementite by heating the steel such that the soluble carbon concentration of the martensite parent phase is adjusted to 0.35 to 0.8 wt%, 2 to 15% by volume of granular cementite having an average particle diameter of 1.5 μ m or less is dispersed in the parent phase, and 10 to 50% by volume of retained austenite is formed.--- Also claim 21 should be amended to recite if heating steps are performed before or after induction hardening.

16. Claims 22 and 23 are indefinite because they depend on claim 21.

Allowable Subject Matter

17. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Claims 21 to 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter: A rolling element having a quench hardened rolling contact surface layer characterized by a martensite parent phase dispersed with 2 to 15% by volume cementite such that cementite contains 2.5 to 10 wt% Cr, which is achieved by a thermal treatment step, as recited by claims 2, 3 and 21 to 23, is not taught or fairly suggested by the art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00 am-2:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Deborah Yee/
Primary Examiner, Art Unit 1793

/DY/